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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/541,444

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Erik C Cota-Robles

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EXAMINER

OPIE, GEORGE L

ART UNIT

PAPER NUMBER

2126

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/541,444	Cota-Robles	
	Examiner	Art Unit	
	George L. Opie	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 7 December 2004.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
 - 4a) Of the above claim(s) ☐ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ☐ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-18, 20, 22-23, 25 and 27-29 is/are rejected.
- 7) ☒ Claim(s) 9, 19, 21, 24, 26 and 30 is/are objected to.
- 8) ☐ Claim(s) ☐ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ☐ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ☐ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
 1. ☐ received.
 2. ☐ received in Application No. (Series Code / Serial Number) ☐.
 3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- | | |
|--|---|
| 14) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 17) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) <input type="checkbox"/> . |
| 15) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 18) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 16) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <input type="checkbox"/> . | 19) <input checked="" type="checkbox"/> Other: USP5,530,860 |

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DETAILED ACTION

Responsive to Applicant's arguments filed 7 December 2004, this Office Action vacates the previous rejection.

1. Request for copy of Applicant's response on floppy disk:

Please help expedite the prosecution of this application by including, along with your amendment response in paper form, an electronic file copy in WordPerfect, Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk.

Please include all pending claims along with your responsive remarks. Only the paper copy will be entered -- your floppy disk file will be considered a duplicate copy. Signatures are not required on the disk copy. The floppy disk copy is not mandatory; however, it will help expedite the processing of your application. Your cooperation is appreciated.

2. Allowable Subject Matter

3. Claims 9, 19, 21, 24, 26 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Obviousness-type double patenting rejection

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Uogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 09/931,072. Although the conflicting claims are not identical, they are not patentably distinct from each other because of corresponding language that recites many of the same elements and functions, i.e., "*scheduling ... virtual machines*", "*determining a resource requirement for the virtual machines*", and "*scheduling, said virtual machines, at least in part on said resource requirement*".

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Claims 2-8, 10-16 and 27-28, in the instant Application, are provisionally rejected on the same grounds as claim 1 above.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Terminal Disclaimer

5. A timely filed terminal disclaimer in compliance with 37 C.F.R. ' 1.321(b) would overcome an actual or provisional rejection on this ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 C.F.R. ' 1.78(d).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. The U.S. Patents used in the art rejections below have been provided as text documents which correspond to the U.S. Patents. The relevant portions of the text documents are cited according to page and line numbers in the art rejections below. For the convenience of Applicant, the cited sections are highlighted in the *text documents*.

7. Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5-6, 10-13 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuura (U.S. Patent 5,530,860) in view of Gulick (U.S. Patent 6,421,702).

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As to claim 1, Matsuura teaches a method for scheduling a plurality of virtual machines (control program 21 for operating a plurality of guest VMs, p5 53-57) comprising:

determining a respective resource requirement for each virtual machine (resource assignment ratio predetermined for each of the guest VM 13-1 through VM 13-5, p8 3-8) and

scheduling said plurality of virtual machines based, at least in part, on said respective resource requirement values (assignment order control unit 22 checks the ... assignment ratios ... determines the assignment order for guest VM13-1 through VM13-5, p9 23-31).

Matsuura does not explicitly disclose the additional limitations detailed below.

Gulick teaches determining a respective resource requirement for a plurality of process machines (information necessary to schedule the tasks of the application, p7 15-27)

determining a respective interrupt period for a plurality of process machines (each task lists its interval, p7 48-56) and

scheduling said plurality of process machines based, at least in part, on said respective resource requirement and interrupt values (scheduler 218 specifies execution based on the interval and duration of each task, p10 1-27).

It would have been obvious to combine Gulick's teachings with Matsuura because the management of interrupt period for "time-slice interval rate may vary", p8 1-4 according to the requirements of each application, and thus the system would adaptively schedule its processing for each of the virtual machine's, thereby facilitating the efficacy of each VM's operations.

As to claims 2-3, Gulic (p3 40-51) teaches "[e]ach isochronous task informs the operating system of an execution interval and a duration."

As to claims 5-6, note the rejections of claims 2-3 above.

As to claims 10-13, note the discussions of claims 1, 6, 3 and 2 respectively. Claims 10-13 are the same as claims 1, 6, 3 and 2, except claims 10-13 are computer program product claims and claims 1, 6, 3 and 2 are method claims.

As to claim 27, note the rejection of claim 1 above. Claim 27 is the same as claim 1, except claim 27 is an apparatus claim and claim 1 is a method claim.

9. Claims 4, 7-8, 14-16 and 28-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuura in view of Gulick and further in view of Maytal (U.S. Patent 6,092,095).

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As to claim 4, Maytal teaches the service manager 50 for maintaining resource requirements (p2 40-45 and pages 6-8). It would have been obvious to combine Maytal's teachings with Gulick because the service manager would facilitate administration efficacy by adjusting resource allocations to each VM as its requirements warrant for acceptable operations and optimal system usage/performance.

As to claim 7, note the rejection of claim 4 above.

As to claim 8, Maytal (p8 27-56) teaches performance monitoring for scheduling and adjusting resource requirements as recited. It would have been obvious to combine Maytal's teachings with Gulick because the monitoring of a VM's actual usage would enable the system to perform resource allocation tuning for continually maximizing the system's capabilities.

As to claims 14-16, note the discussions of claims 4 and 8 above. Claims 14-16 are the same as claims 4 and 8, except claims 14-16 are computer program product claims and claims 4 and 8 are method claims.

As to claims 28-29, note the discussions of claims 4 and 8 supra. Claims 28-29 are the same as claims 4 and 8, except claims 28-29 are apparatus claims and claims 4 and 8 are method claims.

10. Claims 17-18, 20, 22-23 and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webber (U.S. Patent 6,412,035).

As to claim 17, Webber (p5 10-24) teaches the determining interrupt values by initializing the interrupts and generating virtual interrupts, and filtering (Fig. 2, page 5) and adjusting the interrupt period values (page 6 47-52). Although Webber does not explicitly disclose the rejecting aperiodic interrupts, it would have been an obvious modification for one skilled in the art to have included this rejection in the filtering taught by Webber, as certain processes employ non-preemption modes.

As to claim 18, Webber (p4 14-40) teaches the scheduling VMs with respect to resource requirement values as claimed.

As to claim 20, Webber (p2 38 – p3 9) teaches scheduling VMs contingent on interrupt frequency and resource requirements, and for one skilled in the art, the recited resource requirement adjustments would have naturally flowed from Webber's interrupt management teachings for handling real-time operations in general purpose operating systems.

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As to claims 22-23 and 25, note the discussions of claims 17-18 and 20 respectively. Claims 22-23 and 25 are the same as claims 17-18 and 20, except claims 22-23 and 25 are computer program product claims and claims 17-18 and 20 are method claims.

11. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Each reference disclosed below is relevant to one or more of the Applicant's claimed invention.

U.S. Patent No. 6,374,286 to Gee et al. which teaches the resource management and scheduling of multiple virtual machines;

U.S. Patent No. 6,075,938 to Bugnion et al. which teaches the virtual machine monitors for coordinating/adjusting VM operations; and,

U.S. Patent No. 5,528,513 to Vaitzblit et al. which teaches the scheduling based on interrupt period parameters.

12. Response to Applicant's Arguments:

Applicant's remarks, filed 7 December 2004, have been considered but are moot in view of the new grounds of rejection.

Contact Information:

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private-PAIR or Public-PAIR.

Status information for unpublished applications is available through Private-PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

All OFFICIAL faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the Office, e.g., Finance Division for fee charging, etc.

All responses sent by U.S. Mail should be mailed to:

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (571) 272-3766 or via e-mail at George.Opie@uspto.gov. Internet e-mail should not be used where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.


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